Aufkleber

BARTEC

MSB and HSB Cold applied technology

21-1780-7D001/E-05/2013-BEH-D278663

Installation and Operation

Connection and Remote End Termination for
MSB and HSB heating system
Type 27-1780-..10/.... and Type 27-1980-1.10/....

21-1780-7D001/E-05/2013-BEH-D278663

1. Product description

The Ex-heating system HSB type 27-1780-**10/**** with the HSB (type 07-5803-***A) self-limiting parallel heating tape or the Ex-heating system MSB Typ 27-1980-1*10-****/**** with the MSB (type 07-5804-2**X and type 07-5804-2**Y) self-limiting parallel heating tape, assembled with a connection and remote end termination system (installation kit 05-0091-0129** or kit 05-0091-0135**) in cold connection technology, is set up as a stationary resistance heating system for pipelines or containers in hazardous areas.

The Ex-heating system HSB type 27-1780-**10/**** is used in Zone 1, 2, 21 or Zone 22 according to the certified explosion group II and temperature classes T2, T3, T4. The Ex-heating system MSB type 27-1980-1*10-****/**** is used in Zone 1, 2, 21 or Zone 22 according to the certified explosion group II and temperature classes T3 or T4. After assembly the supply wires and the twisted protective braid of the heating tape are always to be connected to terminals in an enclosure with "increased safety" protection class in conformance to the relevant standards (EN 60079-0 and EN 60079-7).

NOTICE

Please read carefully as this operation manual will be applicable for connection and termination with the cold applied technology described for HSB and MSB heating cables. Technical limits are to be found in the type examination certificates.

2. Technical data

Rated voltage
208 to 254 V

Rated current
max. 32 A

Explosion protection

Ex protection type HSB
Ⓔx II 2G Ex e II 200 °C (T2), T3 , T4,
Ex e II 200 °C (T2), T3, T4
Ⓔx II 2D Ex tD A21 IP 65 T 200 °C, T 195 °C, T 130 °C
Ex tD A21 IP 65 T 200 °C, T 195 °C, T 130 °C

Ex protection type MSB
Ⓔx II 2G Ex e IIC 150 °C (T3), T4
Ex e IIC 150 °C (T3), T4
Ⓔx II 2D Ex tD A21 IP 65 T 150 °C, T 130 °C
Ex tD A21 IP 65 T 150 °C, T 130 °C

Certification
KEMA 08 ATEX 0110
IECEx KEM 09.0083

Conformity to standards
EN 60079-0:2006, EN 60079-7:2007, EN 60079-30-1:2007, EN 61241-0:2006, EN 61241-1:2004, IEC 60079-0:2004, IEC 60079-7:2006, IEC 60079-30-1:2007, IEC 61241-0:2004, EN 61241-1:2001

Minimum bending radius
25 mm

Maximum operation temperature
HSB +120 °C heating circuit energized
MSB +110 °C heating circuit energized

Maximum withstand temperature (Applied termination component)
HSB +190 °C heating circuit de- energized
MSB +130 °C heating circuit de- energized

Ambient temperature range
HSB -55 °C up to +55 °C
MSB -40 °C up to +55 °C
(cut- in and ambient work- piece and installation conditions)

Max. cross section of the supply cable
6 mm²
4 mm² (in combination with PLEXO)

Protection class
IP 65

3. Safety Instructions

The relevant installation and operating regulations must be observed for electrical systems in hazardous areas (e. g. Directive 1999/92/EC, Directive 94/9/EC, IEC/EN 60079-14, IEC/EN 60079-17 and the DIN VDE 0100 series).

The requirements under EN 60519-1 and EN 60519- 2 must be adhered to. Thermal Safety Class 0 under EN 60519-2 Section 13 is met by the heating tapes design characteristics. The copper braid with a resistance of < 18.2 W/km is suitable as a protective conductor.

The minimum requirements for circuits protection and control requirements are defined in IEC/EN 60079-30-1 clause 4.3 and 4.4. The operator of an electrical system in a hazardous environment has to keep the equipment in an orderly condition, operate it correctly, monitor it and do the required maintenance and repairs (IEC/EN 60079-14, IEC/EN 60079-17, IEC/EN 60079-19).

DANGER

Read these instructions to avoid lethal injuries and damage to property by use of the BARTEC self-limiting heating tapes HSB type 07-5803-*A or BARTEC self-limiting heating tapes MSB type 07-5804-2**X and 07-5804-2**Y in explosive atmosphere.**

4. Assembly of heating circuits

The assembly of all heat trace connections must be completed carefully according to the manufacturer's installation manual supplied with the connection sets.

Connections and terminations for installation with this self-limiting heating tapes shall be certified according to the requirements of the applicable standards for their types of protection for potential explosive gas and combustible dust atmospheres, as well as the requirements of IEC/EN 60079-30-1 and IEC/EN 60079-31 (IEC/EN 61241-0) as integral parts of this trace heating system.

For the connection of the BARTEC self-limiting heating tapes type MSB and HSB to power certified glands, enclosures and terminals shall be used that are suitable for the application and are correctly installed.

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Reservation
Technical data subject to change without notice. Changes, errors and misprints may not be used as a basis for any claim for damages.

The cable glands shall be mounted in an enclosure in such a way that the ingress protection rating IP 65 for use in explosive atmospheres caused by the presence of flammable gas and/or vapours, IP 6X for use in explosive atmospheres caused by the presence of combustible dust is ensured. Ingress of protection ratings is according to IEC/EN 60529.

Before installing any connection to the cable, check the electrical resistance between the active bus wires and the protective braid or other equivalent electrically conductive material (refer to IEC/EN 60079-30-2 clause 8.3.4). It must be at least 20 MΩ for a minimum supply voltage of DC 500 V. The use of maximum test voltage of DC 2500 V is recommended.

The minimum circuit protection requirements for trace heating systems for use in hazardous area follows .

Always refer to IEC/EN 60079-30-1 clause 4.3.

1. A means of isolating line conductors from the supply;
2. Over-current protection provided for each branch circuit;
3. A means of protecting against earth faults which depend on the type of system earthing (see IEC 60364-3 for definitions).
4. The copper braid must be used as a ground wire, especially as the electrical resistance is less than 18.2 Ω/km.
5. For TT and TN systems: a residual-current protective device for each branch circuit having a rated residual operating current not greater than 300 mA. The device shall have a trip-time not exceeding 150 ms at five times the rated residual operating current. Values of 30 mA and 30 ms are preferred unless there is evidence that this will result in a marked increase in nuisance tripping.
   Always refer to IEC/EN 60079-30-1 clause 4.3.
6. For IT systems: an electrical monitoring device shall be installed to disconnect the supply whenever the electrical resistance is not greater than 50 Ω/V of rated voltage.
   Always refer to IEC/EN 60079-30-1 clause 4.3.

⚠ CAUTION

Do not connect the heating tapes two supply wires >> short circuit <<

5. Mounting and commissioning

Assembly

The relevant installation and operating regulations must be observed when setting up or operating explosion protected systems (e. g. EN/IEC 60079-14, EN/IEC 60079-30-2 and the DIN VDE 0100 series).

The self-limiting heating tape must be installed on the work-piece in accordance with the project engineering specifications. Only qualified and trained employees may do any of the work on the machine.

Before any work is done on the machine, it must have come to a complete stop, be disconnected and precautions must be taken to ensure that it cannot be switched on again.

Before and during installation:

keep the ends and connection components of the heating system dry. The metallic braiding in this heating system must be connected to a suitable earthing terminal. The bending radius may not be less than the minimum of 25 mm and the heating tape may not be bent on its narrow side.

The heating tape is attached to the work-piece by means of temperature resistant adhesive tape with a maximum distance of 200 mm. Use only plasticiser-free adhesive tapes (no PVC adhesive tapes)!

To ensure efficient heat transmission, the heating tape must have even contact over the entire length of the surface. If necessary, the distances between fastenings must be reduced.

The tape is laid on the pipelines either parallel to the axis of the pipe or in spiral form (in accordance with the project engineering instructions). On plastic pipes, which conduct heat less efficiently than metal pipes do, aluminium foil or aluminium adhesive tape is put under or over the heating tape. This substantially improves the distribution of heat, prevents a local accumulation of heat and at the same time it partly compensates for the lower heat dissipation and associated reduction in the capacity of the heating tape.

Once the heating system with accessories has been mounted, the insulation resistance between the heating conductor and the metallic braid must be verified.

The testing voltage should be at least DC 500 V and the insulation resistance at least 20 MΩ EN 60079-30-2 Section 8.3.4)

ⓘ NOTICE

Mounting, commissioning and operation of self-limiting parallel heating tape MSB type 07-5804-2X and type 07-5804-2**Y is not allowed with crossing or overlapping. Choice of a safety temperature limiter shall comply with EN 60079-30-1.**

Commissioning

The equipment may only be operated if it is clean, in the range of the operation limits and free of any damage. Electrical systems must be examined by an electrician before commissioning and afterwards at certain intervals of time.

- After mounting and before cut-in the self-limiting heating tape HSB type 07-5803-***A or BARTEC self-limiting heating tapes MSB type 07-5804-2**X and 07-5804-2**Y must be checked for the electrical resistance between the active bus wires and the braid or other equivalent electrically conductive material (refer to IEC/EN 60079-30-2 clause 8.3.4). It must be at least 20 MΩ for a minimum supply voltage of DC 500 V. The use of maximum test voltage of DC 2500 V is recommended.
- Refer to IEC EN 60079-30-1 clause 4.3.and 4.4 pre-installation testing shall include:
  - Individual controls shall be tested to ensure correct calibration including, but not limited to set points, operating temperature range and span.
  - Vendor fabricated and assembled control panels shall include documentation certifying that all wiring, layout and functions are correct and have been tested. Upon receipt of the control panels at the work site, a general inspection shall be made to confirm also that no damage has occurred in transit.

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■ Documents:

Operations and mounting manual self-limiting heating tapes MSB 01-5804-7D0001

Operations and mounting manual self-limiting heating tapes … HSB… and self-limiting heating tapes…03-0390-0042

This manual for cold applied connection and termination kits 21-1780-7D0001

Operation and mounting manual PLEXO connection and termination kits 21-1780-7D0003

6. Operation, maintenance and fault clearance

The heating systems must be used only in accordance with their intended purpose and within the operating data specified by BARTEC. The operator of an electrical system in a hazardous environment must keep it in good condition, operate it properly within the limits of the certificate, monitor it and do maintenance and repairs. (IEC/EN 60079-14 and IEC/EN 60079-17). Only an electrician may do the maintenance work and fault clearance.

Before re-starting operation, check compliance with the applicable laws and directives. Before maintenance or troubleshooting, make sure that the specified safety regulations are adhered to.

NOTICE

Don´t touch the surface of the BARTEC HSB type 07-5803-*A or MSB type 07-5804-2**X or type 07-5804-2**Y while these are energized. First-/second-/third-degree burn can occur. Don´t touch also the heated areas. Warning signs shall be installed.**

Only use parts of origin.

7. Accessories and Equipment see BARTEC catalogue

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Deutschland
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Fax: +49 7931 597-119
info@bartec.de
www.bartec-group.com

Self-limiting heating tapes HSB and MSB	
Type selection	**Description**
05-0091-0129	Single HSB Cold applied set for direct connection (on enclosure) and end termination (Silicone)
05-0091-0135	Tenfold package HSB Cold Applied Set for direct connection (on enclosure) and end termination (Silicone)
05-0091-013501	Tenfold HSB Connection Set without end cap, Cold Applied Set (Silicone)
05-0091-013502	Tenfold HSB Termination Set, Cold Applied Set (Silicone)
05-0091-013503	Fiftyfold HSB Connection Set without end cap, Cold Applied Set (Silicone)
05-0091-013504	Fiftyfold HSB Termination Set, Cold Applied Set (Silicone)

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Reservation
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8. Heating circuit length

Maximum heating circuit length (m) and definition of the circuit breaker (C- tripping characteristic)										
Type	**Start-up temperature °C**	**W/m**	**Operation voltage < AC 120 V**				**Operation voltage < AC 254 V**			
			16 A	**20 A**	**25 A**	**32 A**	**16 A**	**20 A**	**25 A**	**32 A**
			m	**m**	**m**	**m**	**m**	**m**	**m**	**m**
HSB 10 07-5803-.10 A	**+10**	**10**	100	120	120	120	200	235	235	235
	-15		89	120	120	120	175	235	235	235
	-30		82	120	120	120	165	225	230	235
HSB 15 07-5803-.15 A	**+10**	**15**	80	95	95	95	165	189	189	189
	-15		56	75	80	95	117	152	170	189
	-30		52	75	80	95	110	144	160	189
HSB 25 07-5803-.25 A	**+10**	**25**	60	69	69	69	110	140	140	140
	-15		44	59	64	69	88	120	130	140
	-30		40	55	60	69	80	114	120	136
HSB 30 07-5803-.30 A	**+10**	**30**	44	58	58	58	85	114	114	114
	-15		35	45	50	58	69	92	100	114
	-30		32	41	45	58	65	86	92	110
HSB 45 07-5803-.45 A	**+10**	**45**	35	41	41	41	70	82	82	82
	-15		24	33	35	41	49	66	75	82
	-30		22	26	32	41	45	62	70	78
HSB 60 07-5803-.60 A	**+10**	**60**	25	32	32	32	50	64	64	64
	-15		20	25	28	32	38	52	58	64
	-30		17	21	26	32	35	48	52	60

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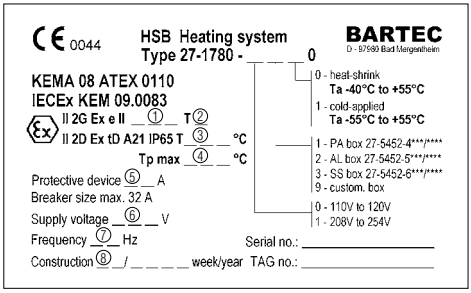
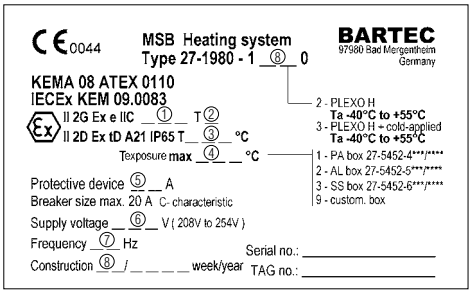
Maximum heating circuit length (m) and definition of the circuit breaker (C- tripping characteristic)						
Type	**Start-up temperature °C**	**W/m**	**Operation voltage < AC 254 V**			
			16 A	**20 A**	**25 A**	**32 A**
			m	**m**	**m**	**m**
MSB 10 07-5804-2...	**+10**	**13**	200	235	235	235
	-25		175	235	235	235
	-50		165	225	230	235
MSB 15 07-5804-2...	**+10**	**19.5**	165	189	189	189
	-25		117	152	170	189
	-50		110	144	160	189
MSB 25 07-5804-2...	**+10**	**27.5**	120	140	140	140
	-25		88	120	130	140
	-50		80	114	120	136
MSB 30 07-5804-2...	**+10**	**34.5**	85	114	114	114
	-25		69	92	100	114
	-50		65	86	92	110
MSB 40 07-5804-2...	**+10**	**44**	70	82	82	82
	-25		49	66	75	82
	-50		45	62	70	78

9. Type label heating system

The type label is to be filled in manually on the basis of the shown points. The blanks in the heating system's type number must be filled on the basis of the components used. A water-proof and lightfast marker must be used (e. g.: Staedtler Lumocolor permanent special marker or BARTEC no.: 02-7140-0001).

The serial number (connection and termination set) must and the TAG number can be filled in by the person setting up the heating-circuit. A practical example of a filled-in type label is given further on. The type label must be stuck onto the lid of the junction box. The surface must be cleaned first before the glue is applied. Care must be taken that the sticker is put on carefully. It may not jut out over the correct area and it may not have any air bubbles.


CE 0044
HSB Heating system
Type 27-1780 - _ _ _ _ 0
BARTEC
D - 97980 Bad Mergentheim
KEMA 08 ATEX 0110
IECEx KEM 09.0083
II 2G Ex e II _ ① _ T ②
II 2D Ex tD A21 IP65 T _ ③ _ °C
Tp max _ ④ _ °C
Protective device ⑤ A
Breaker size max. 32 A
Supply voltage _ ⑥ _ V
Frequency _ ⑦ _ Hz
Construction ⑧ / _ _ _ _ week/year
Serial no.: _____
TAG no.: _____
0 - heat-shrink
Ta -40°C to +55°C
1 - cold-applied
Ta -55°C to +55°C
1 - PA box 27-5452-4***/****
2 - AL box 27-5452-5***/****
3 - SS box 27-5452-6***/****
9 - custom. box
0 - 110V to 120V
1 - 208V to 254V


CE 0044
MSB Heating system
Type 27-1980 - 1 _ ⑧ _ 0
BARTEC
97980 Bad Mergentheim
Germany
KEMA 08 ATEX 0110
IECEx KEM 09.0083
II 2G Ex e IIC _ ① _ T ②
II 2D Ex tD A21 IP65 T _ ③ _ °C
Texposure max _ ④ _ °C
Protective device ⑤ A
Breaker size max. 20 A C- characteristic
Supply voltage _ ⑥ _ V (208V to 254V)
Frequency _ ⑦ _ Hz
Construction ⑧ / _ _ _ _ week/year
Serial no.: _____
TAG no.: _____
2 - PLEXO H
Ta -40°C to +55°C
3 - PLEXO H + cold-applied
Ta -40°C to +55°C
1 - PA box 27-5452-4***/****
2 - AL box 27-5452-5***/****
3 - SS box 27-5452-6***/****
9 - custom. box

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HSB

Type	Rated voltage	Operation voltage ⑥	Max. pipe temperature	Max. temperature ④	Temperature ①	T-class ②	Temperature ③
07-5803-110 A	120 V	impressed voltage		Max. pipe (exposure) temperature of design documents		T3	195 °C
07-5803-115 A	120 V					T3	195 °C
07-5803-125 A	120 V					T3	195 °C
07-5803-130 A	120 V					T3	195 °C
07-5803-145 A	120 V				200 °C	T2	200 °C
07-5803-160 A	120 V				200 °C	T2	200 °C
07-5803-210 A	254 V		> 105 °C			T3	195 °C
07-5803-210 A	254 V		≤ 105 °C			T4	130 °C
07-5803-215 A	254 V		> 70 °C			T3	195 °C
07-5803-215 A	254 V		≤ 70 °C			T4	130 °C
07-5803-225 A	254 V		> 55 °C			T3	195 °C
07-5803-225 A	254 V		≤ 55 °C			T4	130 °C
07-5803-230 A	254 V		> 25 °C			T3	195 °C
07-5803-230 A	254 V		≤ 25 °C			T4	130 °C
07-5803-245 A	254 V					T3	195 °C
07-5803-260 A	254 V		≤ 120 °C			T3	195 °C

MSB

Type	Rated voltage	Operation voltage ⑥	Max. pipe temperature	Max. temperature ④	Temperature ①	T-class ②	Temperature ③
All	254 V	impressed voltage	≤ 110 °C	Max. pipe (exposure) temperature of design documents	150 °C	T3	150 °C
MSB 10	254 V		≤ 100 °C			T4	130 °C
MSB 15	254 V		≤ 90 °C			T4	130 °C
MSB 25	254 V		≤ 80 °C			T4	130 °C
MSB 30	254 V		≤ 70 °C			T4	130 °C
MSB 40	254 V		≤ 60 °C			T4	130 °C

⑤ **Protection device** 16 A, 20 A, 25 A, 32 A/C- Characteristic

⑦ **Frequency** 50 or 60 Hz

⑧ **Construction and week/year** 15/2009 (for example)

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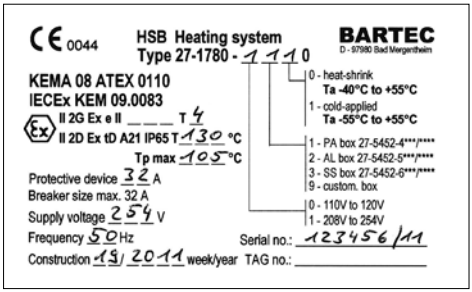
Practical example

The following components were used: HSB, AC 254 V, 10 W/m, cold-applied connection and termination technology, BARTEC Polyester junction box; It was filled in according to the grey-shaded line in the HSB table.


CE 0044
HSB Heating system
Type 27-1780 - 1 1 1 0
BARTEC
D - 97980 Bad Mergentheim
KEMA 08 ATEX 0110
IECEx KEM 09.0083
II 2G Ex e II ____ T 4
II 2D Ex tD A21 IP65 T 130 °C
Tp max 105 °C
Protective device 32 A
Breaker size max. 32 A
Supply voltage 254 V
Frequency 50 Hz
Construction 19 / 2011 week/year
Serial no.: 123456/111
TAG no.: _____
0 - heat-shrink
Ta -40°C to +55°C
1 - cold-applied
Ta -55°C to +55°C
1 - PA box 27-5452-4***/****
2 - AL box 27-5452-5***/****
3 - SS box 27-5452-6***/****
9 - custom. box
0 - 110V to 120V
1 - 208V to 254V

Non-BARTEC enclosure

If an enclosure from another company is used, all requirements specified in the checklist must be fulfilled.

The enclosure material is limited to the selection indicated. The external dimensions of the enclosure must conform to the specific minimum dimensions. Certification of "e" increased safety type of protection in compliance with EN 60079-7 must be presented for all components.

Requirements set for connecting terminals

Material		
Polyester		☐
Aluminium		☐
Stainless Steel		☐
External dimensions of enclosure		
1 Heating circuit	min. 122 x 120 x 90 mm	☐
1 - 3 Heating circuits	min. 220 x 120 x 90 mm	☐
Ambient temperature	-55 °C up to +55° C (HSB) -40 °C up to +55 °C (MSB)	☐
Protection class	EN/IEC 61241-0 min. IP 65	☐

Requirements set for connecting terminals

Rated cross-section	min. 6 mm²	☐
Working temperature	-55 °C up to +100 °C (HSB) -40 °C up to +100 °C (MSB)	☐
Minimum distance between conducting terminals and wall	25 mm	☐

Requirements set for the cable gland

Working temperature	-55 °C up to +70° C (HSB) -40 °C up to +70 °C (MSB)	☐

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Reservation
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Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

N° **21-1780-7C0001**

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Wir	We	Nous
BARTEC GmbH,		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
HSB Heizsystem	**HSB heating system**	**HSB systéme de chauffage**
	Typ 27-1780-*0/******	
auf das sich diese Erklärung bezieht den Anforderungen der folgenden **Richtlinien (RL)** entspricht	to which this declaration relates is in accordance with the provision of the following **directives (D)**	se référant à cette attestation correspond aux dispositions des **directives (D)** suivantes
ATEX-Richtlinie 94/9/EG	**ATEX-Directive 94/9/EC**	**ATEX-Directive 94/9/CE**
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
EN 60079-0:2006 **EN 61241-0:2006**	**EN 60079-7:2007** **EN 61241-1:2004**	**EN 60079-30-1:2007**
Kennzeichnung	**Marking**	**Marquage**
II 2 G Ex e II 200°C (T2), T3, T4 **II 2 D Ex tD A21 IP65 T200°C, T195°C, T130°C**		
Verfahren der EG-Baumusterprüfung	**Procedure of Ex-Type Examination**	**Procédure d'examen CE de type**
KEMA 08 ATEX 0110		
CE 0044		

Bad Mergentheim, den 29.09.2009

ppa. Ewald Warmuth
Geschäftsleitung / General Manager

03-0383-0289

21-1780-7D001/E-05/2013-BEH-D278663

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

Nº 21-1980-7C0001

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany

Wir	We	Nous
BARTEC GmbH,		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
MSB Heizsystem	**MSB heating system**	**MSB système de chauffage**
	Typ 27-1980-10/**** **	
auf das sich diese Erklärung bezieht den Anforderungen der folgenden **Richtlinien (RL)** entspricht	to which this declaration relates is in accordance with the provision of the following **directives (D)**	se référant à cette attestation correspond aux dispositions des **directives (D)** suivantes
ATEX-Richtlinie 94/9/EG	**ATEX-Directive 94/9/EC**	**ATEX-Directive 94/9/CE**
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
EN 60079-0:2006	EN 60079-7:2007	EN 60079-30-1:2007
EN 61241-0:2006	EN 61241-1:2004	
EN 61000-6-2:2005	EN 61000-6-4:2007	EN 62395-1:2006
Kennzeichnung	**Marking**	**Marquage**
II 2 G Ex e II 150 °C (T3), T4 II 2 D Ex tD A21 IP65 T 150 °C, T 130 °C		
Verfahren der EG-Baumusterprüfung / Benannte Stelle	**Procedure of EC-Type Examination / Notified Body**	**Procédure d'examen CE de type / Organisme Notifié**
KEMA 08 ATEX 0110 0344, DEKRA Certification B.V., Utrechtseweg 310, 6812 Arnhem, NL		

CE 0044

Bad Mergentheim, den 27.07.2012

ppa. Ewald Warmuth
Geschäftsleitung / General Manager

03-0383-0289

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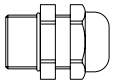
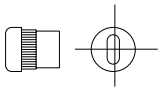
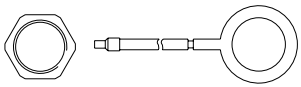
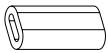
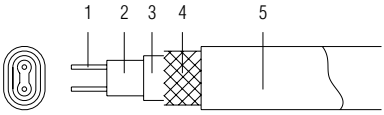
Installation kit 05-0091-0129xx/05-0091-0135xx

a	
b	
c	
d	
e	
f	
g	
h	

Self-limiting parallel heating cable



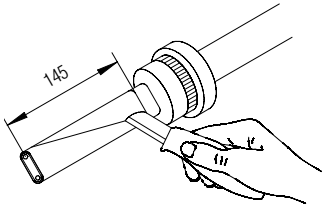
1 wire
2 heating element
3 insulating jacket
4 metal braid covering
5 protective outer sheath

Connection

The dimensions specified in the installation instructions must be strictly observed!

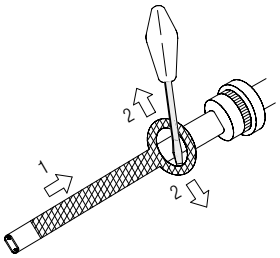
Cut the heating tape with a straight cut.
Push on the cap for screw connection **a** and sealing **b**.

Remove 145 mm of the protective outer sheath from the heating tape.



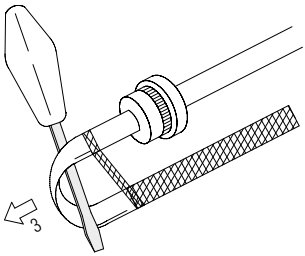
1

Push the protective braid back (1). Use the screwdriver to form an eyelet (2). Be careful not to damage the internal insulation.



2

Pull the heating tape out of the protective braid (3).



3

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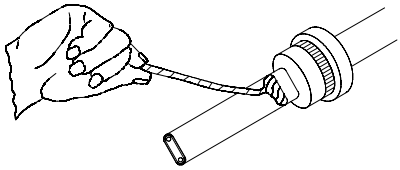
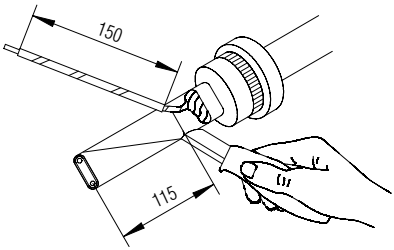
Twist the metal braid covering.



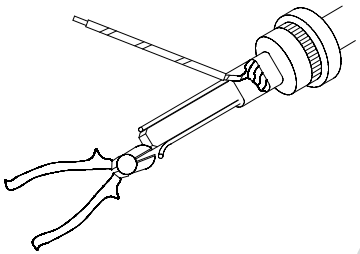
4

Push the green/yellow heat shrinkable tubing **e** (150 mm) onto the twisted metal braid covering. Make an incision into the insulating jacket at a point 115 mm from the beginning of the heating tape and remove that amount.



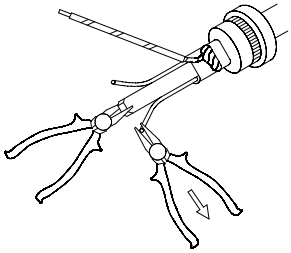
5

Make an incision into the edges of the heating element.



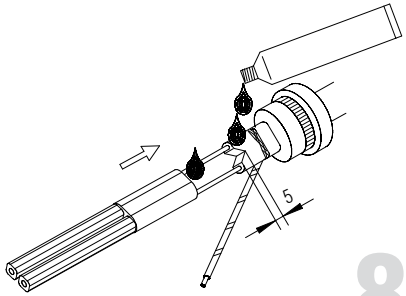
6

Pull the strands out and twist them. Remove the remaining heating element. (Fig. 7 and 8)

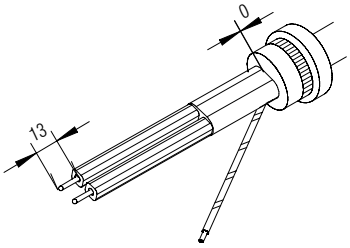


7

Cut out a triangle (5 mm) between the strands. Put some silicone adhesive **h** onto the exposed heating element, the insulating jacket and into the silicone hose. Push the silicone hose **d** over the exposed wire and the insulating jacket. Push the sealing **b** directly up to the silicone hose.



8



9

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Reservation
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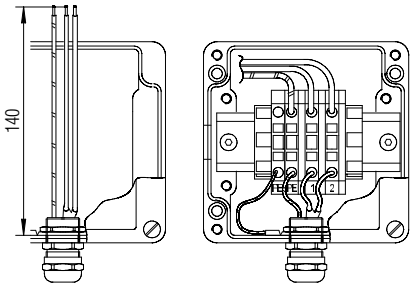
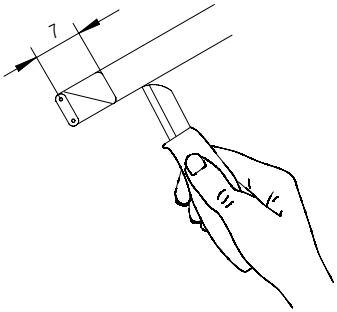
Screw the screw connection body **a** in the enclosure. Push the grounding strap **c** over the thread and secure it with a nut **b**. Connect the green/yellow core wire of the grounding strap to the PE. Connect the heating tape in the junction box to L, N and PE, insert the heating tape with the pushed-on sealing into the screw connection body and tighten the screw cap. The grounding strap **c** is not needed for stainless steel or aluminium enclosures.



10

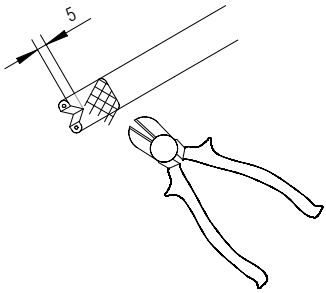
Cut off the heating tape with a straight cut. Remove 7 mm from the protective outer sheath on the heating tape.



11

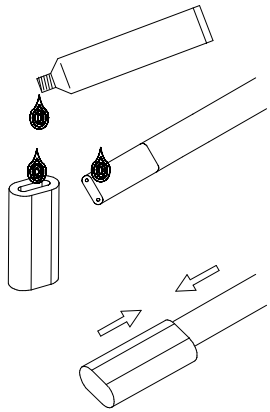
Remote end termination

Take the metal braid covering off the end of the heating cable. Make sure that the internal insulation is not damaged. Cut out a triangle (5 mm) between the strands.



12

Put silicone adhesive **h** into the end cap **g** and onto the exposed insulating jacket. Push the end cap over the end of the heating tape until some of the adhesive oozes out.



13

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